

## A DEVICE FOR DERIVING ENERGY FROM MOVING FLUIDS

The present invention concerns a system and all the variants thereof  
5 for the exploitation of fluvial, marine and wind currents with the  
purpose of producing renewable and ecologic energy.

It is well known that at present, even if there is a great need of  
finding new ecologic and renewable energy sources, the important  
10 sector of the natural currents of the fluids, like the surface and depth  
marine currents, the fluvial and the wind currents, is neglected and  
even ignored.

And the more, such energy sources appear to be fit to supply an  
15 important component of the energy consumption.

It is the aim of the present invention to allow an easy, economic and  
high efficiency exploitation of the natural currents of the fluids, for  
transforming the same into an energy to be immediately exploited  
20 or stored up.

The aim set forth is reached by means of the system according to  
the present invention, for the energy exploitation of fluvial currents,  
placed on bridges P or onto special structures, and for altitude water  
25 to be used as potential energy, and for the application to bi-  
directional or multi-directional marine and wind currents.

The present invention will be described more in detail hereinbelow, relating to the enclosed drawings in which some embodiments are shown.

- 5     Figures 1 and 2 show a perspective view and a front scheme of a system for energy exploitation of fluvial currents, according to the present invention.

Figures 3, 4 and 5 show a front, lateral and planimetric view.

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Figures 6, 7 and 8 show a lateral, planimetric and front view of a float system for pumping the water into basins or into collection reservoirs.

- 15     Figures 9 and 10 show a lateral and axonometric view of the working of the blades of a turbine for the exploitation of the liquid currents.

- Figures 11 and 12 show an axonometric and planimetric view of  
20     some variants for energy exploitation of bi-directional wind or submarine currents.

- Figures 13 and 14 show an axonometric and planimetric view of  
some variants of the system according to the present invention for  
25     the energy exploitation of multi-directional wind or submarine currents.

The enclosed figures show a system for energy production from natural currents of the fluids, comprising:

- a plurality of floats 1 which allow a controlled immersion of special turbines 4 in the waterway below a bridge P;
  - 5 - a plurality of hooking rods 2, passing through a plurality of openings 3 on said floats 1, so as to allow their installation between the lateral arches AL of said bridge P;
  - a plurality of electric turbines 4, housed inside said floats 1, operated by the currents of the waterway in which they are  
10 immersed;
  - a plurality of grates 5 for the protection of said turbines 4, placed onto said floats 1 by means of guide systems which allow an easy removal for maintenance or complete replacing.
- 15 As far as the working of the system according to the present invention is concerned, the funnel-shape of the floats 1, as shown in figures 3, 4 and 5 determine an increase of the power of the waterway current flowing through turbines 4 – proportional to the width and to the length of the storage – thus determining a  
20 consequent increase of the total efficiency.

With the purpose of preventing collisions with silt which, transported by the current, might cause damage, the present invention provides the presence of special floating baffles 6, placed  
25 upstream of said bridge P and appropriately oriented so as to lead the floating silt towards the centre of the waterway, forcing its

passage through the central arch AC of said bridge P, being of such dimension that it is impossible to obstruct it; while said floats 1, placed between the lateral arches AL of said bridge P, are provided with special grates 5 for the protection of turbines 4, so as to avoid  
5 bumps with silt escaped from the action of said baffles 6.

For the same purpose, known means are used for the temporary raising or the temporary immersion of above mentioned devices by means of electronic controls controlled by level meters, able to  
10 determine the increase of weight introducing water inside said floats 1 through special valves, with the intention of determining the movement of the same onto said hooking rods 2 present between the lateral arches AL of said bridge P.

15 On the other hand, the realization of special underground downflow channels 7 is provided for standing floods, and said channels are realized in correspondence of the waterway level in its normal condition, so as to favour the elimination of exceeding water and maintain the level at such a height as not to compromise the  
20 functionality of the device and prevent possible structural damages to the bridge P, from which said devices are released.

For what concerns the variant shown in figures 6, 7, 8, 9 and 10 for pumping the water into storage basins or reservoirs, the following  
25 elements are shown:

- a plurality of floats 1', for supporting a turbine 8;

- eventual hooking rods 2', passing through a plurality of openings 3' on said floats 1', so as to assure the system to the ground of the river or onto special structures;
- a turbine 8 provided with shaped blades 9, operated by the current of the waterway, and its movement is stored and made uniform by a fly-wheel 10 connected thereto;
- a plurality of grates 5' for the protection of said turbines 8, placed on said floats 1' by means of guide systems allowing an easy removing for maintenance or complete replacing;
- mechanical transmissions 11 with differential gear, for transferring the motion of said turbine 8 towards special compressors 12, thus determining the functioning thereof;
- a plurality of compressors 12 for pumping the water and leading it towards the collection and distribution basins or reservoirs 13.

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For what concerns the functioning, the special shape of said floats 1' determines an increase of the power with which the current of the waterway puts into rotation the turbine 8, through the action of the blades 9, thus increasing the total efficiency.

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The rotation of said turbine 8, made uniform by the action of the fly-wheel 10, is transferred from differential gears 11 to compressors 12 for the pumping of the water, and lead towards collection basins or reservoirs or, in alternative, towards the users through storage and distribution pipings 13.

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In a variant, said compressors 12 may be replaced by generators or magnets for energy production.

The variant of the system for the exploitation of bi-directional wind  
5 or submarine currents, shown in figures 11 and 12, consists of a whole of structures 14, 15 specially shaped for the purpose of giving place to particular forced channels 16 for guiding the currents, in the two directions, to the central turbine 17.

10 In the variant shown in figures 13 and 14, the energy exploitation of multi-directional wind or submarine currents provides a whole of structures 18 shaped in such a way as to give place to special forced channels 16', for guiding the currents towards the central turbine 17', independently from their direction.

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